SANDEN
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Installation manual

Eco system of Sanden

Sanden Heat Pump Water Heater with Natural Refrigerant (CO2)

Covering model numbers
GAUS-315EQTD
GAUS-315EQTE

Heat Pump Unit GAU-A45HPA

Tank Unit
GAU-315EQTE

Contents

Cover page....1
Contents....2
Introduction....3
How it works....3
Installation details/layout....4
Installation location....5
Heat Pump Unit installation....6
Heat Pump/Water piping installation....7
Water piping installation....8
Heat Pump Unit Water piping....9
System Piping....10
Electrical installation....11
Electrical connections....12
How to connect tank unit thermistor cable....13
System operation On/Off Peak power....14
Electrical Wiring....15
Filling the system - Air Purge....16
Freeze Protection....17
Unit Operation - Time Setting....18
Blackout time setting....19
Maintenance Mode....20
Maintenance Mode....21
Error Codes....22
Error Codes....23
Water supply quality....24
Dimensions and Technical Data....25
Dimensions and Technical Data....26
Wiring Diagram....27
Warranty Policy....28
Warranty Period....29
Post installation inspection checklist....30
Check sheet....31
Memo....32

PATENTS

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Note: Every care has been taken to ensure accuracy in preparation of this publication. No liability can be accepted for any consequences that may arise as a result of its application. Sanden is in a process of continuous improvement with, therefore specifications may be different to those referenced in this manual – Please contact Sanden International or it's distributors for the latest specifications at the time of install.

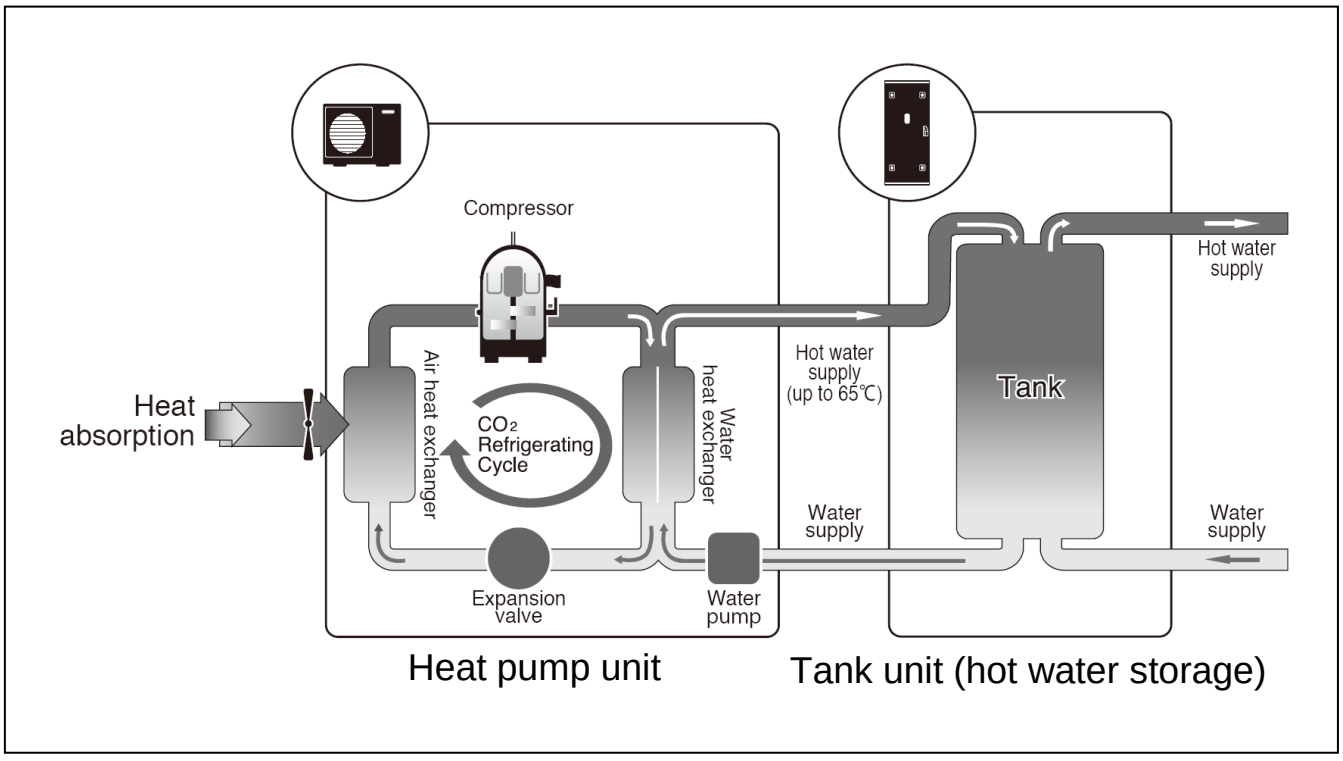
Introduction

The Sanden Heat Pump Water Heater System has been designed using the latest refrigeration technology to remove the heat from the air to heat water. The refrigerant we use is CO_2 which does not contribute to global warming, so it allows us to help keep a clean healthy earth for future generations.

We have also considered energy efficiency. By using CO_2 as the refrigerant we have produced one of the most energy efficient units currently available. It's even more efficient when connected to off-peak power[1] and the noise level is so low it will operate unobtrusively throughout the night.

How it works

Figure 1: Heat Pump Water Heater System



Note [1] operating conditions may vary depending on the type of off peak tariff that is available in your area. The unit must have a minimum of 5 hours continuous power available at all time to allow the unit to operate without affecting reliability.

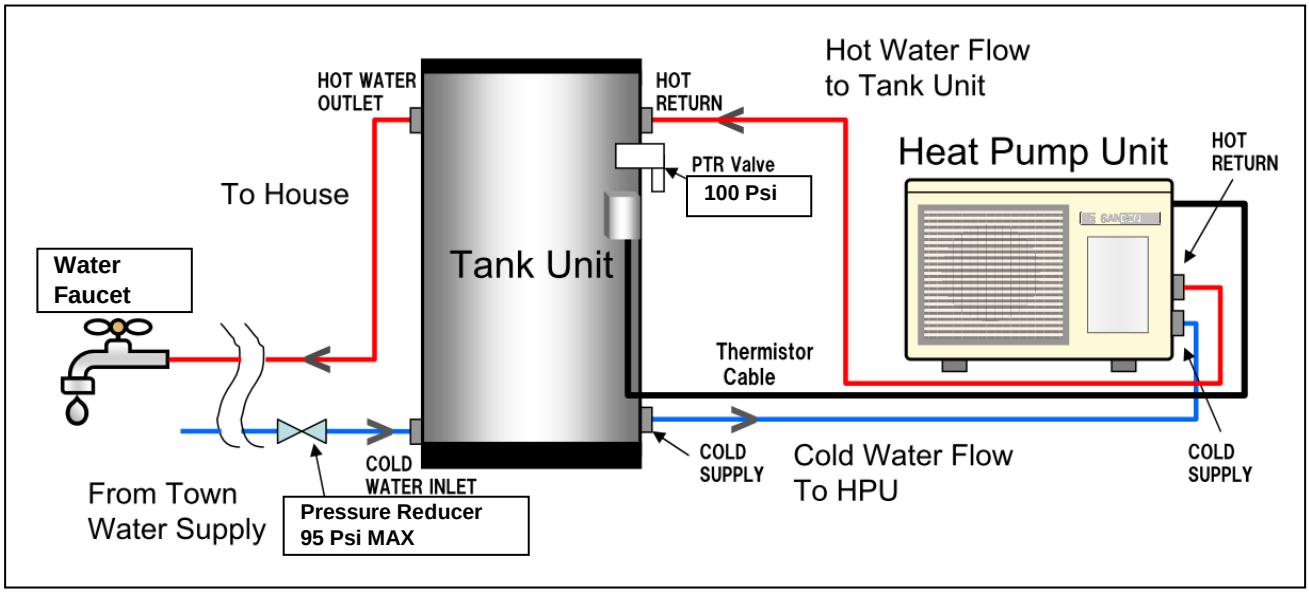
Installation details

This Heat Pump Water Heater System must be installed by licensed personnel in accordance with local building codes:

- Installing contractor should be licensed by applicable state/province and municipal authorities to install an Electrical & Plumbing product.
- The unit has been designed for heating potable domestic hot water and any other usage, such as space heating requires a heat exchanger suitable for local codes to be installed on the system to separate potable and non potable water.
- The unit is designed to operate when connected to the water supply with a maximum operating pressure of 94 PSI (650 kPa). To ensure the mains pressure does not exceed this, first check incoming cold water mains pressure, and then a pressure regulating device must be connected to the water supply line.
- **⚠ DANGER** This system delivers hot water exceeding 120 °F (50 °C). Installation of a temperature tempering device is **MANDATORY** to avoid potential scalds and burns.
- The unit must be stored and transported in an upright position. Failure to do so may render the unit faulty. Such failure is not covered under any warranty agreements.

Failure to comply with the above conditions will void the warranty.

Figure 2: Typical installation layout

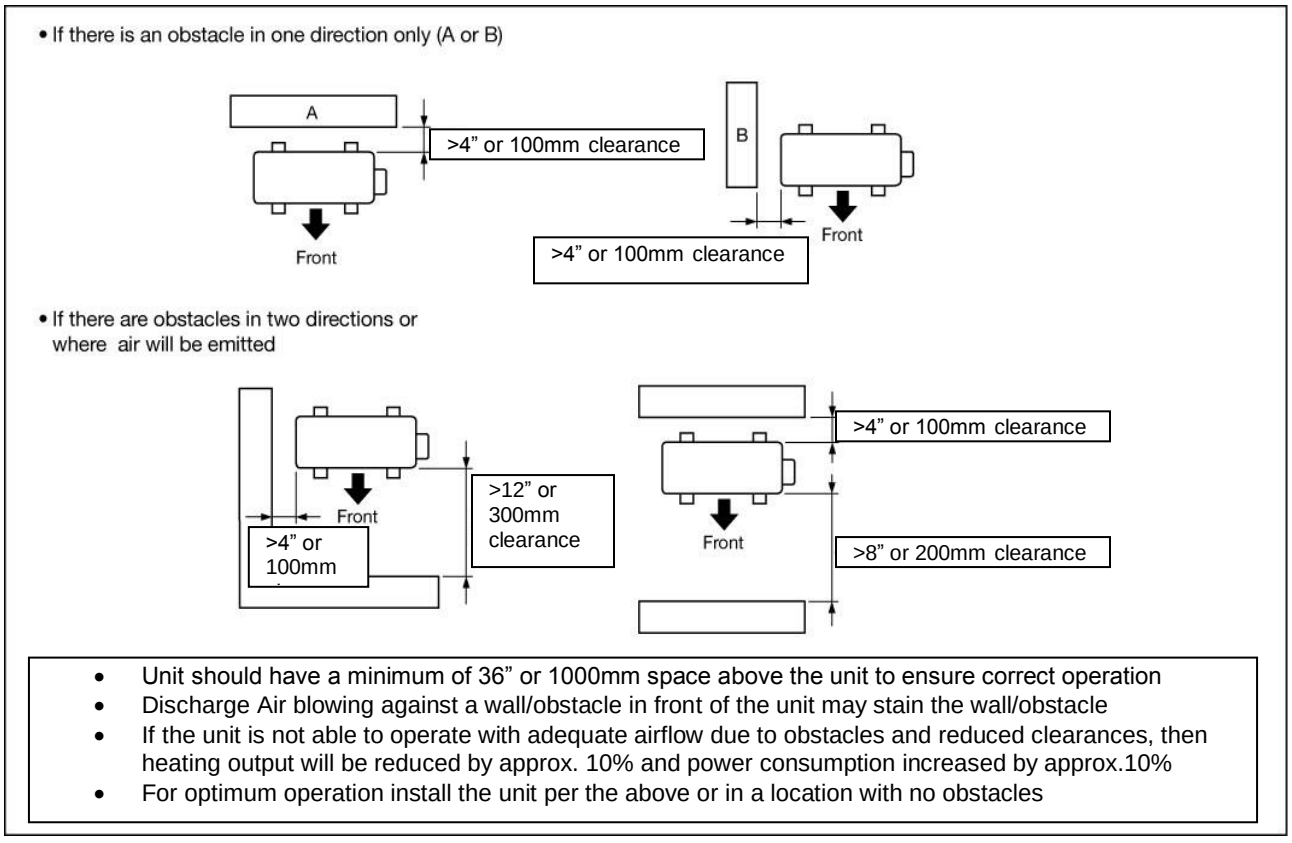


Installation location

- For the most efficient operation of the heat pump unit the optimum location is the warmest side of the property and there should be sufficient space for the air to circulate through the unit.
- The tank unit should be located as close as possible to the most frequently used hot water outlet such as a bathroom. It may be located either outside or inside. The heat pump unit must be located outside and as close as practicable to the tank unit but not further than 50ft (15m) away from the tank.
- Ensure sufficient clearance around the heat pump unit to allow air to circulate and provide adequate space for service maintenance of the unit (Figure 3).
- Although the heat pump unit is very quiet, it is preferable to avoid installing it directly below a bedroom window.
- Install the heat pump unit in an area which allows sufficient ventilation. Poor ventilation may cause the unit to short cycle and this could increase power consumption by more than 10%.
- Do not install the heat pump unit in a confined space.
- If the heat pump unit is installed facing a wall, exhaust air may stain the wall.

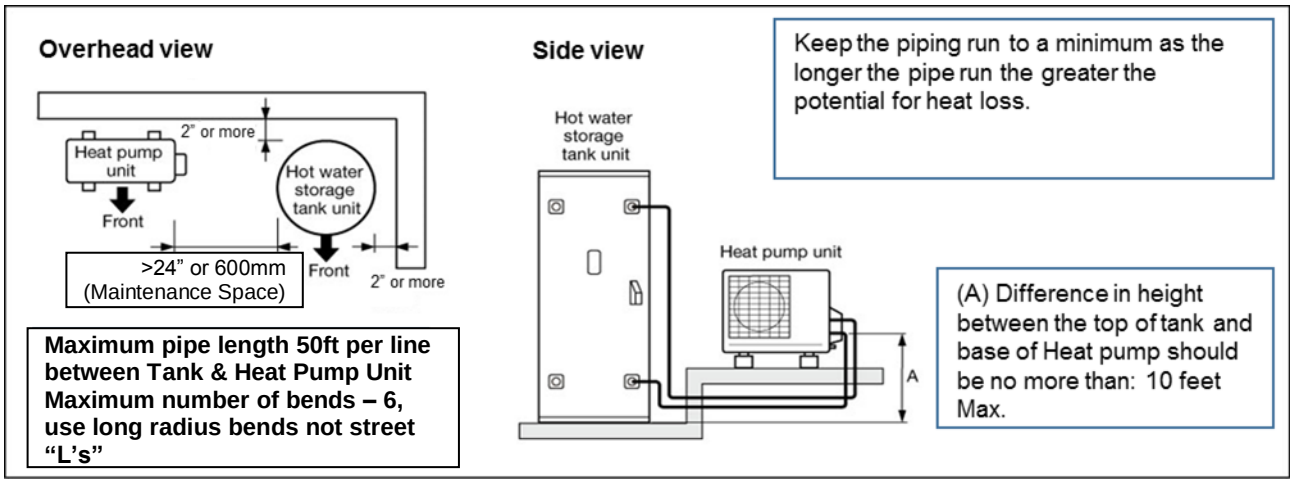
Figure 3: Restrictions on where the heat pump unit can be installed (overhead view)

Installation against a wall or other obstacle >4ft in height


• If there is an obstacle in one direction only (A or B)
A
>4" or 100mm clearance
Front
B
Front
>4" or 100mm clearance
• If there are obstacles in two directions or where air will be emitted
Front
>4" or 100mm
>12" or 300mm clearance
Front
>4" or 100mm clearance
>8" or 200mm clearance

- Unit should have a minimum of 36" or 1000mm space above the unit to ensure correct operation
- Discharge Air blowing against a wall/obstacle in front of the unit may stain the wall/obstacle
- If the unit is not able to operate with adequate airflow due to obstacles and reduced clearances, then heating output will be reduced by approx. 10% and power consumption increased by approx.10%
- For optimum operation install the unit per the above or in a location with no obstacles

Figure 4: Restrictions on installation between the tank unit and the heat pump unit


Overhead view
2" or more
Heat pump unit
Front
Hot water storage tank unit
Front
>24" or 600mm (Maintenance Space)
2" or more
Maximum pipe length 50ft per line between Tank & Heat Pump Unit
Maximum number of bends – 6, use long radius bends not street "L's"
Side view
Hot water storage tank unit
Heat pump unit
A
Keep the piping run to a minimum as the longer the pipe run the greater the potential for heat loss.
(A) Difference in height between the top of tank and base of Heat pump should be no more than: 10 feet Max.

Heat Pump Unit Installation

- The surface to which the heat pump unit is installed must be firm, preferably a concrete pad or block. If the surface is firm there is no need to fix the unit to a base surface, unless there is a likelihood of high wind or local vibration.
  If the heat pump unit and tank unit are to fixed, appropriate fixing devices for the weight/expected duty should be used.
  Note: For California installation this water heater must be braced, anchored, or strapped to avoid falling or moving during an earthquake.
  Note : For Florida installation the Heat Pump unit should be installed in accordance with all local codes regarding Hurricane winds.

- Use appropriately treated lumber or pre fabricated "pump ups" to raise the Heat Pump unit 4"-6" from the ground – this will allow defrost condensate to drain.

- A pressure and temperature relief (PR) valve is included in the installation kit of the tank unit. This is installed in a defined point near the top of the tank unit. The PR valve must have a clear drainage where escaping steam or water can flow freely.

- The installation site must be well drained so that any water accumulating (such as rain or pipe leakage) will drain away and not enter the heat pump unit and the tank unit.

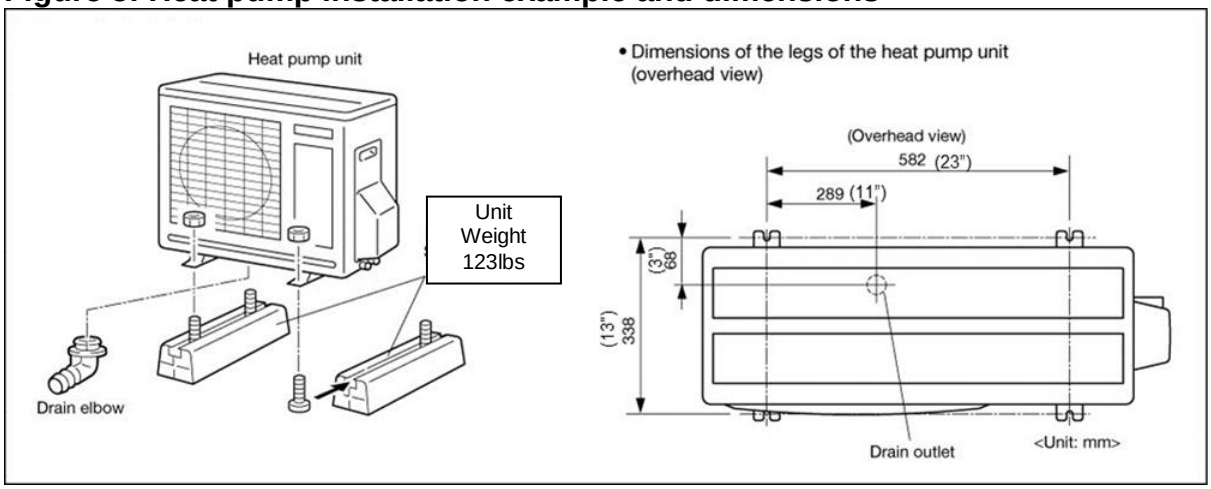
- Supply water pressure must be a minimum of 29 PSI (200 kPa) to ensure Heat Pump unit operation – If pressure is below 29 PSI install a booster pump to water supply.

Note: The entire system is set up and fully functional when supplied. Once all the water and electric connections have been made the system will operate automatically provided that mains power is available.

Cont

The only adjustment required is to the current time setting on the timer setting panel under the top housing cover, especially if the blackout time setting is desired. See current time setting, and blackout time section on page 19.

Figure 5: Heat pump installation example and dimensions



- Attach the drain elbow to the drain opening located on the bottom of the heat pump unit. The drain elbow is included in the installation kit for the heat pump unit.

- Attach a drain hose with 5/8 inch (16mm) of inner diameter to the drain elbow to guide the drained water to an appropriate drain.

Water Piping Installation – Heat Pump Unit & Tank

- All piping that connects to the water supply must be installed by a licensed plumber.

- The water supplied to the system must comply with the potable water quality standard. Use of water that does not comply with this standard could result in a malfunction of the system.

Description	PH	TDS (Total Dissolved Solids)	Total Hardness	Aluminium	Chlorides	Copper	Iron	Manganese	Zinc
Maximum Levels	6.0 to 9.0	Up to 500 ppm	Up to 200ppm or 12 grains hardness	Up to 0.2 ppm	Up to 200 ppm	Up to 1.0 ppm	Up to 0.3 ppm	Up to 0.05 ppm	Up to 5 ppm

- The water supply must have a pressure of 29 PSI (200 kPa) or higher.

- A drain trap must be installed on the drain pipe if water is to be drained to a drain pan

Cont

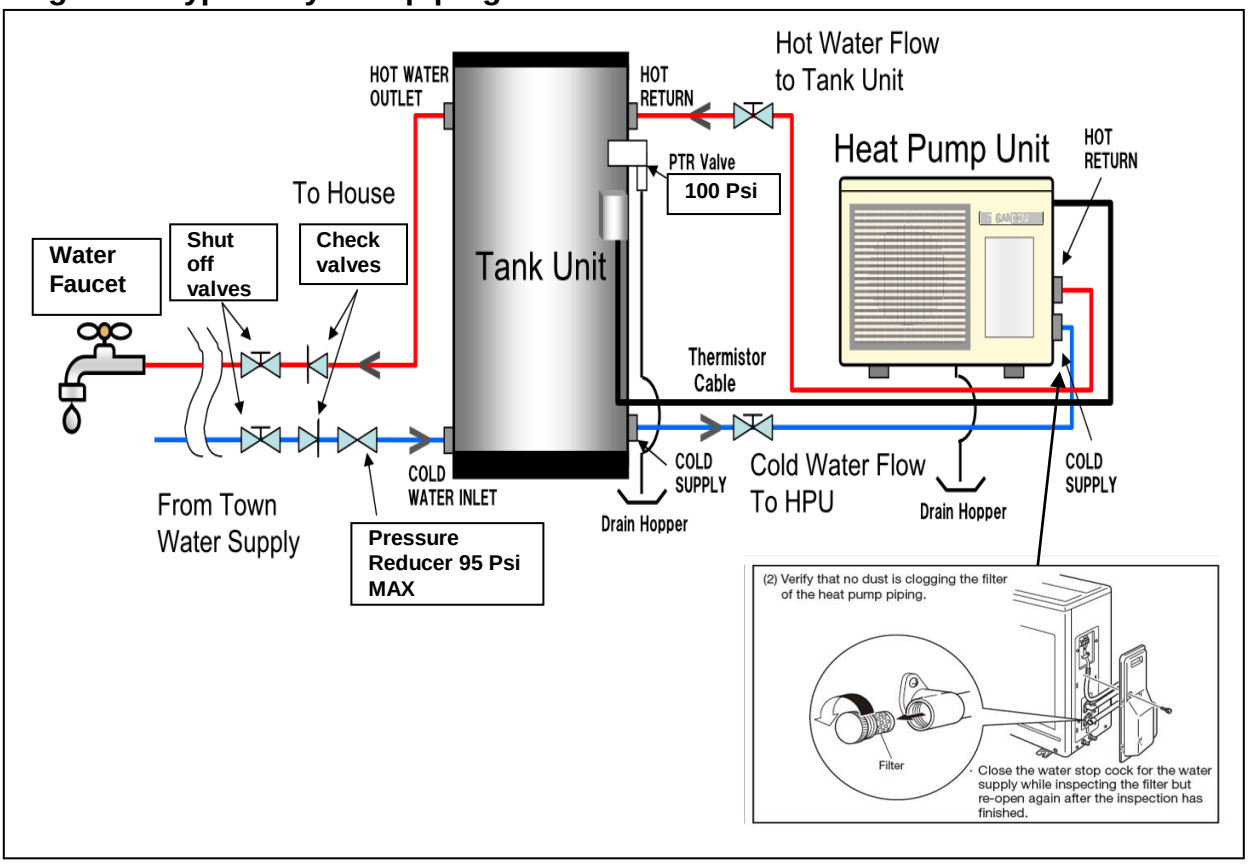
- This product cannot be connected to a solar water heater.
- The piping must be appropriately insulated, consider Heat tape to protect the water piping in areas with freezing temperatures.
- If the piping needs brazing make sure that all flux and flux splatter is wiped away with a wet cloth. When brazing ensure connections are protected using a wet cloth
- As the hot-water supply pipe will expand and contract, use sleeves when penetrating through concrete walls or slabs.
- With buried piping, an outer cover will need to be used that has had both ends sealed to avoid any ingress of rain.
- Use only heat-resistant and corrosive-resistant material to seal the pipe joints.
- Cutting and wrenching the piping material may result in oil and dust adhering to it. After processing, clean the material with a mild detergent before doing any piping work and smooth the edges to remove any scratches and burrs. (After flowing water through it verify whether any debris has accumulated on the filter of the faucet and heat pump unit pipe.)
- When using PTFE sealing tape ensure that no tape is sticking out of the threads.
- If any heat-resistant PVC piping is used and are bonded together, flow water through them after the pipes have set to prevent any bond adhering to the filter or other parts.
- Follow the manufacturer's instruction manual for the type of bond, amount to be applied, curing time, and other specifications.
- If any bond or flux has entered the tank unit and the hot water has a chemical/acrid smell take the following countermeasures.

    a) After heating the water in the tank unit, drain it and clean inside the tank unit. Fill the tank unit with 26 gallons (100 litres) of water and exchange twice.
    b) Clean or change the filter.
    c) Fill up the tank unit.
    d) Drain water from the relief valve for one to two minutes.
    e) Run water from all the hot water supply faucets in the house for about ten minutes to clean inside the pipes.

Heat Pump Unit Water piping

- Connect the heat pump unit COLD supply to the tank unit fitting marked Cold Supply. – ½" NPT Connection (Certain early units may use ½" BSP connections).
- Connect the heat pump unit HOT return to the tank unit fitting marked Hot Return – ½" NPT Connection (Certain early units may use ½" BSP connections).
- Connect the mains water supply to the lower fitting on the tank unit marked Cold Water Inlet.
- Connect the hot water supply pipe to the top of the tank unit marked Hot Water Outlet.
- Install the supplied PR valve to the fitting on the tank unit marked PR valve, pipe from PR valve directly to a Building drain, do not install any shut off valve between PR valve and Building drain.
- Run water through the pipe(s) to remove any debris inside before connecting the pipe(s).
- After all the piping connections are completed, run water through the system.
- Close the shut off valves (four places) and detach the filter on the cold supply connector of the heat pump unit to confirm there is no debris blocking the filter. Clean the filter if any debris is found.
- Remove the air from the system according to the instructions below on Page 16.
- Make sure all the necessary devices are mounted to the pipes as shown in diagram.
  If the heat pump unit piping is kinked or clogged or the air inside was not removed during the test operation, temperature of the supplied hot water may become inconsistent.

Figure 6: Typical System piping



Mains Power/Electrical Installation

⚠ DANGER

- All Electrical Wiring should be done in accordance with the latest edition of the National Electrical Code (NEC) and all local State/Province and Municipality codes.
- The power requirement for the system is a dedicated 15 amp circuit fitted with a circuit breaker. This circuit may be connected to constant power or off-peak power.
- A local disconnect should be installed adjacent to the Heat Pump unit in accordance to NEC and local codes.
- Installation of this system must be carried out only by a qualified installation technician (electrical or plumbing).

Electrical connections

Electrical installation should only be done by a licensed electrician

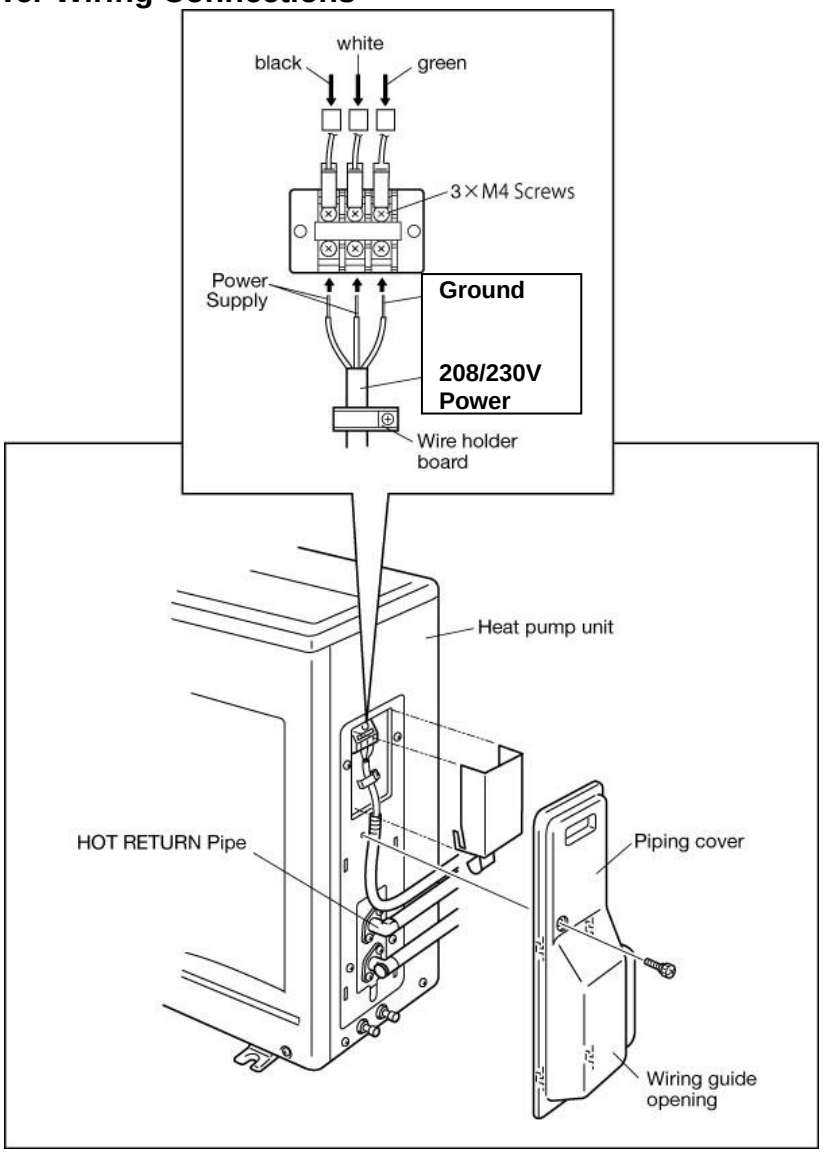
Outline of electrical system connections

- Breaker size and wiring must be sized per NEC rules for the rating plate amperage, MCA and MOP.
- Power Supply is 208/230V-1Ph-60Hz
- Verify that the tank unit is full of water and the water shut off valves are open before turning on the power.

How to connect Main Power

- Remove the piping cover, terminal block cover and screw clamp fitting. (Philips head screwdriver required)
- Connect the power wiring to the terminal block per the wiring diagram/manual
- Ensure ground wire is connected
- Secure the power supply wiring below the terminal block with the screw clamp fitting.
- Attach the terminal block cover and piping cover back on the heat pump unit.

Figure 10: Power Wiring Connections



How to connect Tank thermistor cable to Heat Pump unit

- The thermistor cable and conduit length are designed to cover the maximum allowable distance between the tank unit and heat pump unit (50 feet). If the units are located closer, the thermistor cable and conduit may be cut to the desired length (Figure 11).

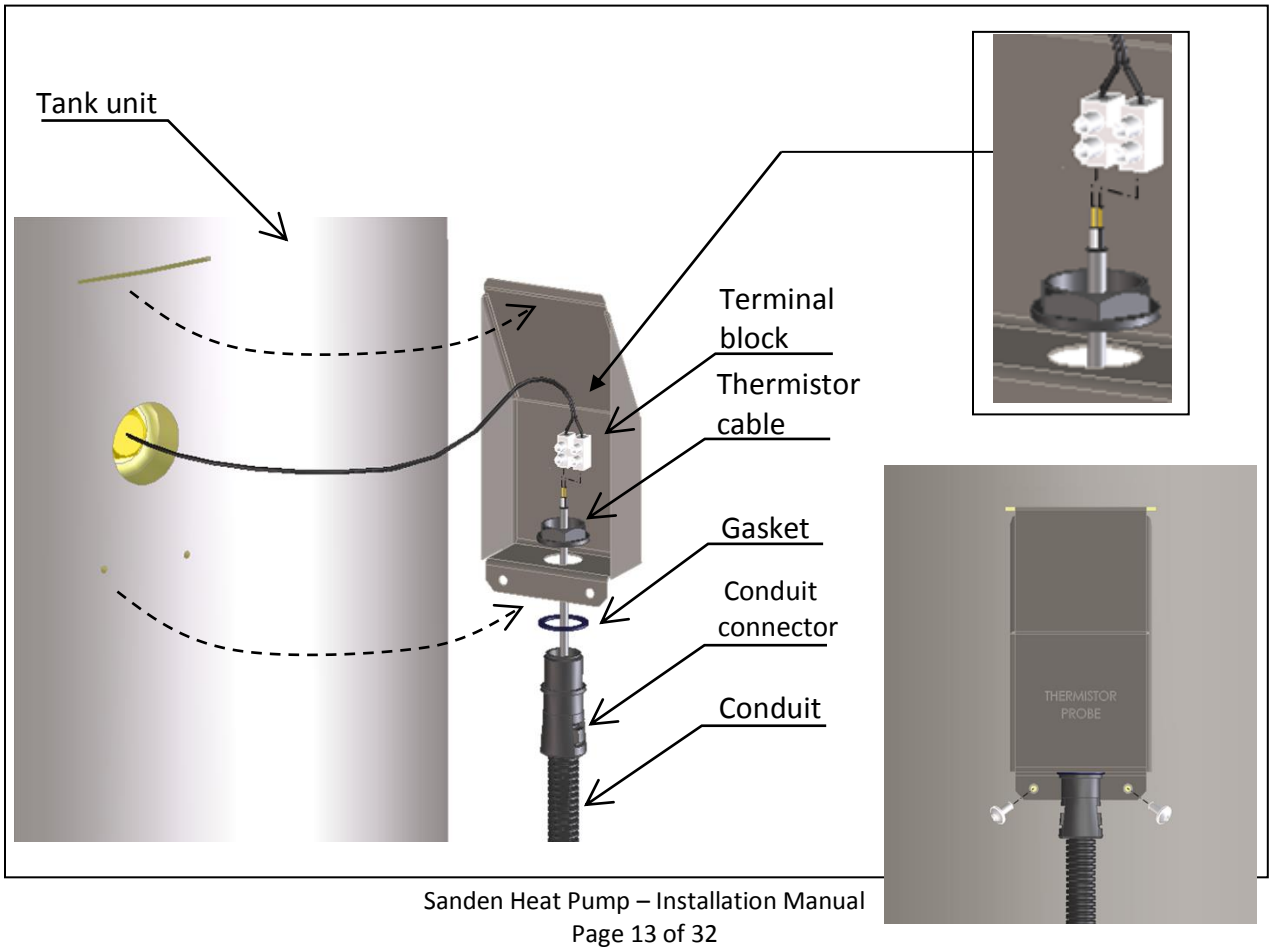
- Attach the conduit connector to the conduit end. Push the conduit into the opening on the connector until the conduit does not go any further. Pull the conduit several times to ensure the connector is fixed properly to the conduit.

- Unscrew and carefully remove the terminal block cover. Do not use unnecessary force to remove the cover as this could pull and break the cable coming out of the tank unit.

- Attach the connector on the end of the thermistor conduit coming from the heat pump unit side to the opening on the bottom of the cover on the tank unit.
  Confirm the gasket is adhered to the thread of the conduit connector before attaching the connector to the cover. If the gasket is not present, there is a risk of water getting inside the cover and this may result in a malfunction of the terminal block.

- Connect the thermistor cables to the bottom of the terminal block.
  Replace the terminal block cover back onto the tank unit and tighten the screws.

Figure 11: Connecting tank unit thermistor cable



System operation using continuous power

- The system runs its water heating cycle once a day to fill up the storage tank unit with heated water.

- If the blackout time function is selected (setting is covered on Page 19) the unit will not operate during the blackout times – this function is typically used on installations that have time of use electricity tariffs.

- The water heating cycle operation starts automatically when the residual hot water in the tank unit is less than 40 gallons (150 litres)

- The system will not run if the electrical power supply is cut off (i.e. if it is connected to off-peak power). However, the system will automatically start operation, once the electric power is restored

System operation if connected to off-peak electricity

- There are no special settings for the off-peak connection. The system will run once power becomes available and the temperature in the tank drops below the set point of the tank thermistor.

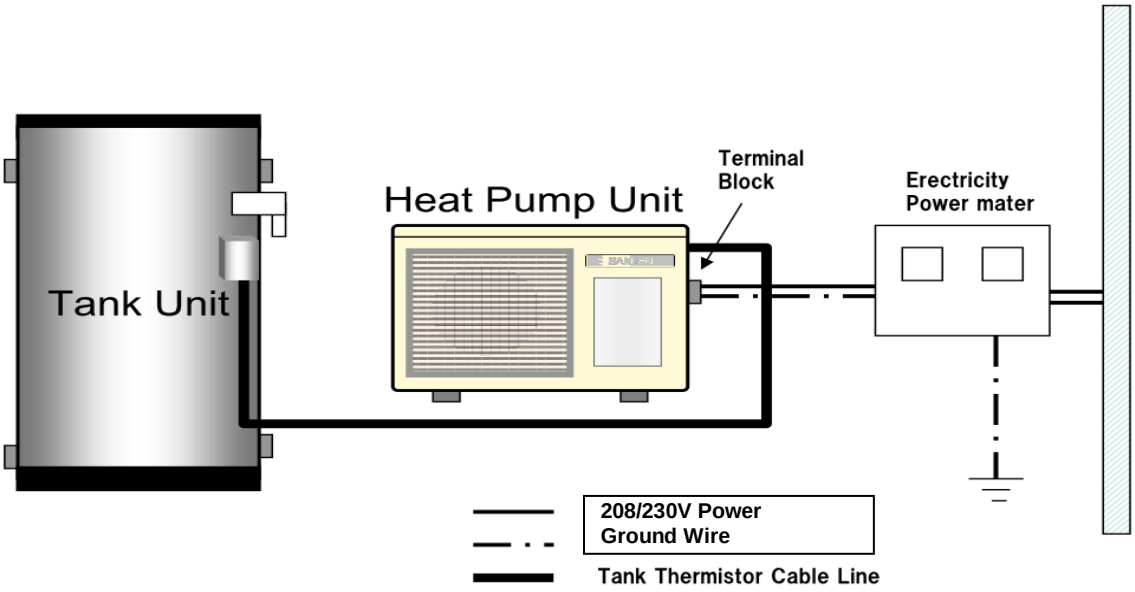
- If connecting the unit to off peak power ensure that the off peak tariff provides a minimum of 5 hours continuous power, as it can take at least four hours to fill the tank unit with hot water.
  If the ambient temperature is lower than 50^{o}F (10^{o}C) this can be longer.

- If the unit is connected to off peak power and hot water consumption has been higher than normal, hot water might not be available until the next power supply cycle.

- Daily frequency and amount of hot water consumption may also affect the duration of the heating cycle operation.

Select the electrical supply mode that best suits the customer's hot water consumption. The type of off-peak connection may need to be changed if hot water supply is not maintained as required.

Figure 9: Outline of electrical system connections



The basic system installation is now complete, the unit is now ready for initial filling, air purge and then start up

Check the Installation against the Installation Check list provided at the end of this manual

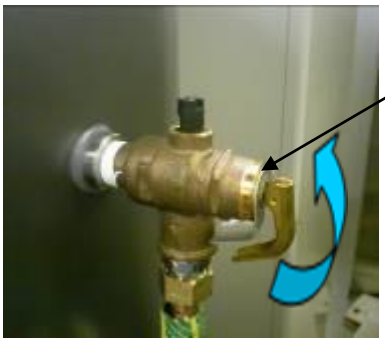
Ensure that the work site is tidy; Sanden International recommends the use of Slim Duct or Fortress product to cover water piping on the outside of the house

Filling the System & Purging Air

The following steps must be taken to ensure all air is removed from the system.
Incorrect purging of air may cause the water temperature to vary during operation.

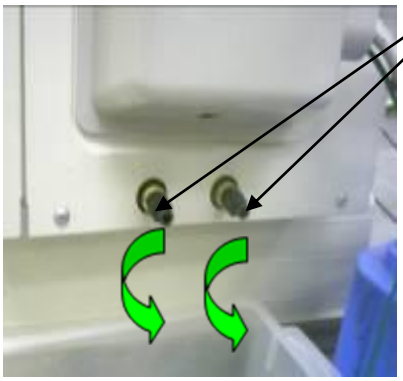
- Ensure that all piping to tank unit and heat pump unit are installed and connections are tight, then open the Cold Water Supply Valve to the system
- Push up the lever on the PR valve to open, and fill the tank unit with water.
  Confirm that water comes out of the relief valve, and then close the lever.
- Open the hot water faucets to remove air from the house piping system.
- Close the faucets after no air is seen in the water.
- Open the water drain plugs (two places) on the heat pump unit.
  Close the plugs after no air is seen in the water.
- Supply power to the heat pump unit and leave the hot water faucets open for 3 minutes.
  Close the faucet after no air can be seen in the water.

Figure 7: Air removal process



PR valve

Plumb pipes to Storage Tank Unit and Heat Pump Unit.
Push up the lever on the PR valve to open,
and fill in the tank with water.
Confirm the water come out of the relief valve,
and then close the lever.



Water drain plugs

Open the faucet to remove air. Close the faucet after no air bubbles can be seen in the water.

Open the water drain plugs (2 places) on the Heat Pump Unit.
Close the plugs after no air is confirmed in the water supply.

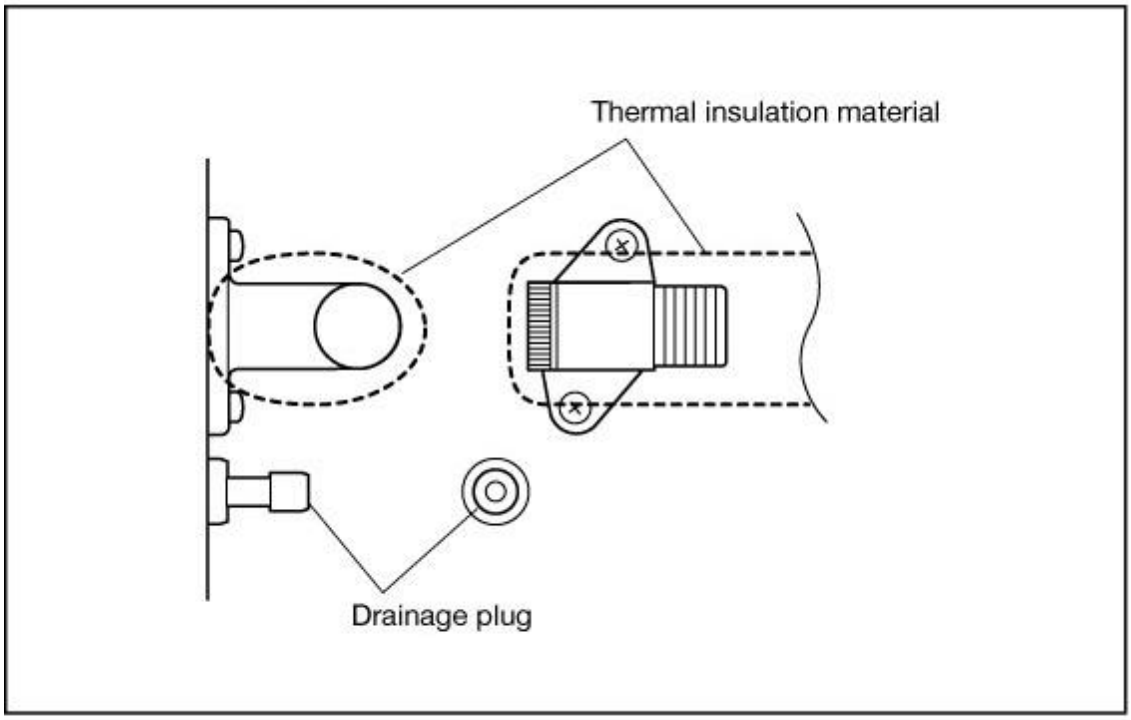
Then connect power to the Heat Pump Unit. Open Faucets.

Freeze protection

- Even if the water pipes have been insulated, the piping can freeze if the surrounding temperature falls below freezing (32ºF). This could cause damage to the equipment and piping so make sure the appropriate freeze protection measures are taken.
- Follow the instructions in the installation manual provided with the freeze protection heat tape.
- After completion of the piping, inspect the plumbing for any water leaks from the joints before installing freeze protection.
- Wrap the freeze protection heater around the pipes, up to the water connectors of the Heat Pump unit.
- Ensure the freeze protection heaters are connected to a 24 hours continuous power supply.
- It is important to fully explain the use and operation of the freeze protection heater to the customer.
- **When turning off the power, because the unit will not be in use, ALL water must be drained from the unit and piping**.

> Note: Heat tape that uses the outside temperature to energize, may not maintain the temperature of the pipes correctly. It is important to use a heat tape that directly senses the pipe's temperature.

Figure 8: Details on wrapping thermal insulation around the piping connector



* Do not wrap thermal insulation around the drain plug.

Unit Operation

Time setting and Blackout time setting

Current time setting

This product contains a built-in clock. As a part of the water heating cycle logic refers to the current time, it is necessary to set the clock before starting to use the product. The current time can be set in the Clock Setting Mode as described below.

*__Note__

There is no need to adjust the time setting for the daylight saving period. Even if the installation is conducted during the daylight saving period, the clock setting to the ordinary time (not daylight saving time) is preferable.

1. Switching to Clock Setting Mode
   Press the “Enter” key in the Display Mode to switch to the Clock Setting Mode. Time Display starts flashing once the mode is switched.

2. Setting the Clock
   The time setting can be adjusted by pressing “Up” and “Down” keys. Fast forward and rewind are available by pressing and holding down a key.

3. Executing Setting the Clock
   After the clock is adjusted to the current time, press the Enter key to execute the setting. The time display stops flashing and comes on once the setting is finished.

*Caution

The display automatically goes back to the Clock Display Mode when no panel operation occurs for more than 60 seconds in the Clock Setting Mode.
If this occurs, changes made will not be reflected to the setting.
If the clock setting is rewound to a time that is earlier than the time when a heating cycle is triggered, the system will start the heating cycle.

*Note

When no panel operation is performed for more than 60 seconds the display switches to the Sleep Mode and turns off.
Sleep Mode is cancelled when Up, Down or Enter key is pressed.

Blackout time setting mode

This mode is used to set the blackout time that stops the heat pump unit operation within the selected time.

Blackout times can be used if the customer has a time of use tariff.

Change the mode

Press and hold down Up and Down keys together in the clock display mode to go to the blackout time setting mode.
Once the mode is changed, 'bo' and '00XX' (00 = start time, XX = end time) are displayed. (Initial setting = 00 o'clock for both start and end)

Adjust set blackout start time

Press Up or Down key and '00' (start time) in '00XX' starts flashing and 'XX' (end time) illuminates.
Now the blackout start time can be adjusted.
Setting can be changed only in hour increments, not in minutes.

Set blackout start time

Press the Enter key to set the desired time setting.
After the start time is set, the start time display stops flashing.
The end time display will now start flashing.

Adjust blackout end time

Set to the desired end time by using Up and Down keys.
Setting can be performed only in hour increments, not in minutes.

Set blackout end time

Press enter key to adjust the desired time setting.
After the end time is set, the start time and end time are displayed for two seconds, then it starts to alternately display 'bo' and '00XX' (00 = start time, XX = end time).

Go back to clock display mode

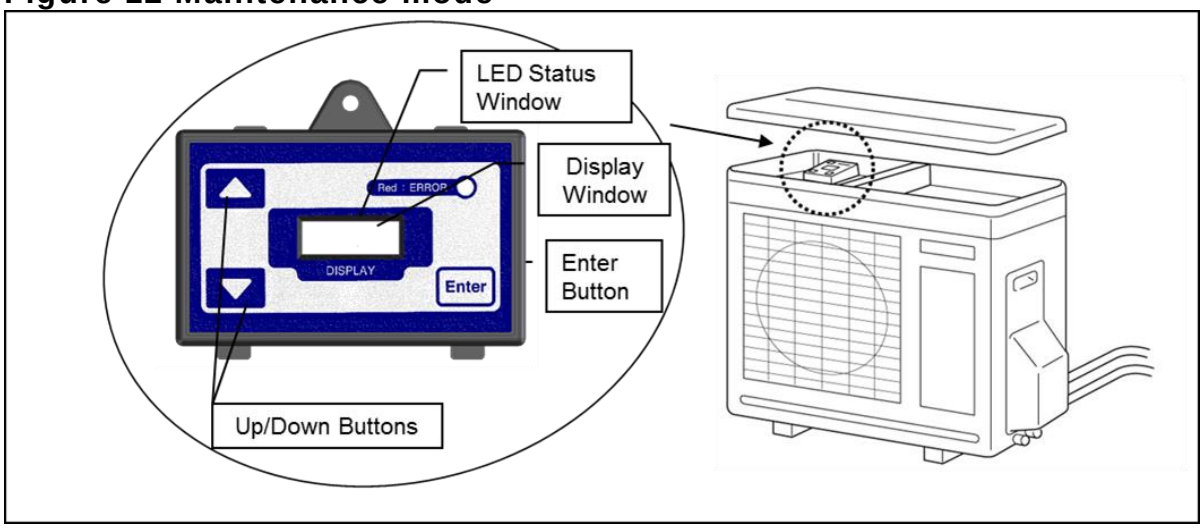
Press Enter key to go back to the clock display mode. It will automatically go back to the clock display mode when no panel operation is performed for more than 60 seconds.
Blackout time setting mode cannot be set unless the end time setting is executed.

Cancel blackout setting

To cancel the blackout setting, set both start and end times to '00'.
Setting to other than '00' (01 ~ 23) will be interpreted as a setting error and the end time will flash.
Make sure to set both times to '00' when cancelling the blackout time setting.

Maintenance Mode

Figure 12 Maintenance mode



Maintenance mode is a function to check the heat pump unit status and to check and perform other settings. It should generally be assumed that the owner does not operate this function. The following modes can be found in the maintenance mode.

Blackout time setting mode
Set the blackout time.

Error history display mode
Check the history of any errors that may have occurred.

Parameter display mode
Check the values measured by the thermistor.

Drive setting mode:
Switch the heat pump unit on/off.

Compulsory operation mode:
Compulsorily operate the water heating cycle. (Force on)

Pump remote operation mode:
Run the water circulation pump.

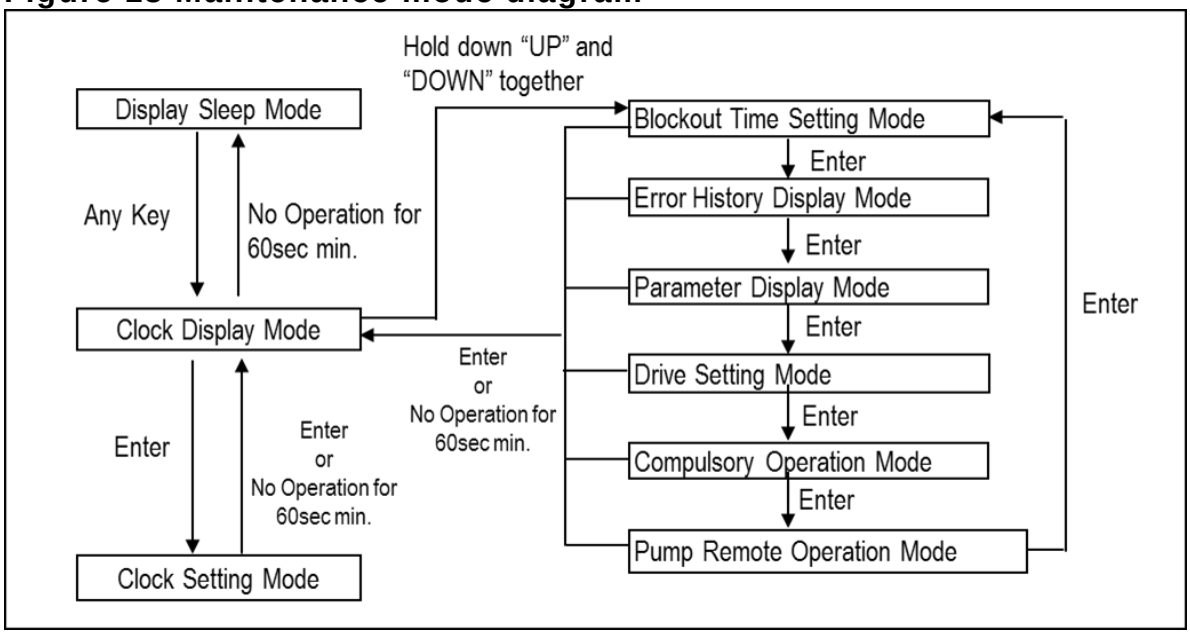
How to switch to Maintenance Mode

Press and hold down Up and Down keys together in the clock display mode to go to the maintenance mode.

After the mode is switched, press the Enter key to select a mode from the six modes described above.

To exit maintenance mode, press and hold down the Enter key, or leave for more than 60 seconds with no panel operation.

Figure 13 Maintenance mode diagram



Error Codes

When an error occurs, a red LED on the timer setting panel turns on and an error code is displayed on the LED display. The panel does not return to the display sleep mode while the error code is shown.

After a component is replaced or the inspection is completed, turn the breaker on/off several times for at least 60-120 seconds each time, to confirm the error does not re-occur.

Below is the list of the error codes. If the corrective action does not solve the error problem, a malfunction of the PCB controller is highly likely.

Error code	Error contents	Corrective action
E000	No error generated	
E010	HP inlet temperature thermistor wire break	Check the thermistor connectors on the main PCB in the heat pump unit for any disconnect, fall-off, wire breakage or short circuit – Measure resistance of the thermistor indicated by the error code
E011	HP inlet temperature thermistor short circuit	
E012	HP outlet temperature thermistor wire break	
E013	HP outlet temperature thermistor short circuit	
E014	HP ambient temperature thermistor wire break	
E015	HP ambient temperature thermistor short circuit	
E016	HP defrost temperature thermistor wire break	
E017	HP defrost temperature thermistor short circuit	
E018	HP discharge temperature thermistor wire break	
E019	HP discharge temperature thermistor short circuit	
E020	Tank thermistor wire break	
E021	Tank thermistor short circuit	
E040	HP water outlet over temperature 1	- Check the heat pump piping filter for blockage/debris - Check for any piping bend, blockage or kinking - Inspect for frozen pipes - Ensure mains water supply is available - Ensure all shut off valves are open - If the water circulation pump is not working, replace the pump
E041	HP water outlet over temperature 2	

E042	HP outlet temperature thermistor detection error	- Check if the thermistor is out of the mounting pocket on the water outlet pipe
E043	HP discharge over temperature 1	- Replace the discharge temp thermistor - Reconnect the expansion valve PCB connector, check to ensure connection - Replace the expansion valve (together with PCB), or the entire heat pump unit
E044	HP discharge temperature Thermistor detection error	
E045	HP defrost thermistor detection error	- Check if the thermistor is mounted in position on the evaporator - Replace the defrost thermistor
E047	High pressure side error	- Check the heat pump piping filter for any blockage - Check for any piping bend, blocking or kink - Check if the pipes are frozen - Ensure mains water supply is available - Ensure all shut off valves are open - If the water circulation pump is not working, replace the pump
E048	High ambient temperature defrost drive error	- Remove foreign objects from the evaporator coil (e.g. fallen leaves, grass, snow) - Replace the ambient temperature thermistor - Replace the defrost thermistor
E070	Fan motor locked	- Reconnect the connector, check if it is off the PCB - Replace the fan motor
E071	Fan motor revolution error	
E073	Water circulation pump locked	- Check the heat pump piping for blockage or kinking - Confirm that the connector for the water circulation pump is connected to the PCB correctly - Replace the water circulation pump
E090 ～ E150	System control error	Replace the PCB

Notes:

1. After a component is replaced or the inspection is completed, turn the unit on/off several times for a minimum of 60 seconds at a time to confirm the error does not re occur.
2. If the corrective actions above do not solve the error problem, a malfunction of the PCB is most likely.

Water Supply Quality (Supplemental)

Chloride and PH

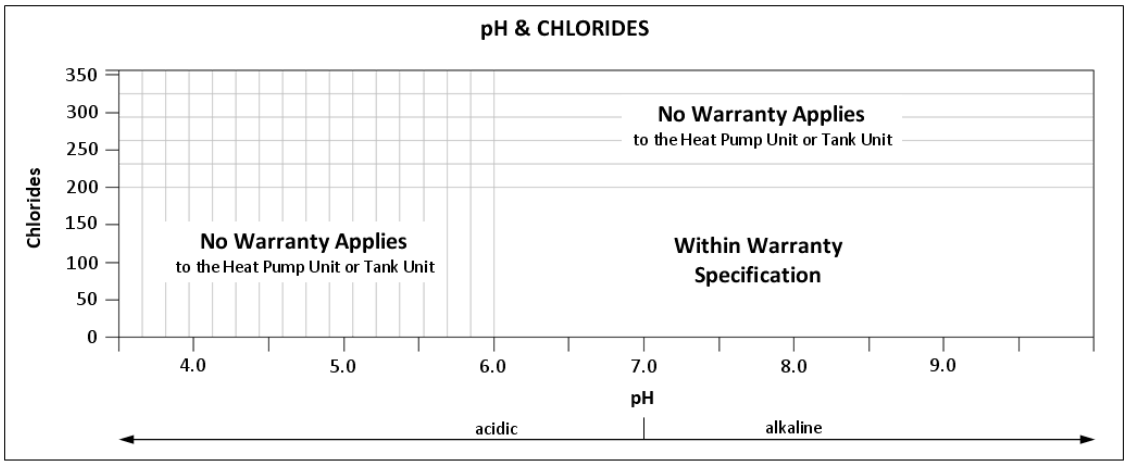
In areas with a high concentration of chloride in the water, that water can cause corrosion and subsequent failures. Where the chloride level exceeds 9 ounces per 66 gallons (250 mg/litre), the warranty is no longer valid on to the heat pump unit and tank unit.

PH is a measure of whether the water is alkaline or acid. In an acidic water supply, the water can attack the parts and cause them to fail.

No warranty coverage is given on the heat pump unit and tank unit where the PH is less than 6.0.

Supply Water with a PH less than 6.0 may be treated to raise the PH.
It is recommended that an analysis of the Supply Water be conducted before connecting the Heat Pump unit to the system.

Figure 14



Change of water supply

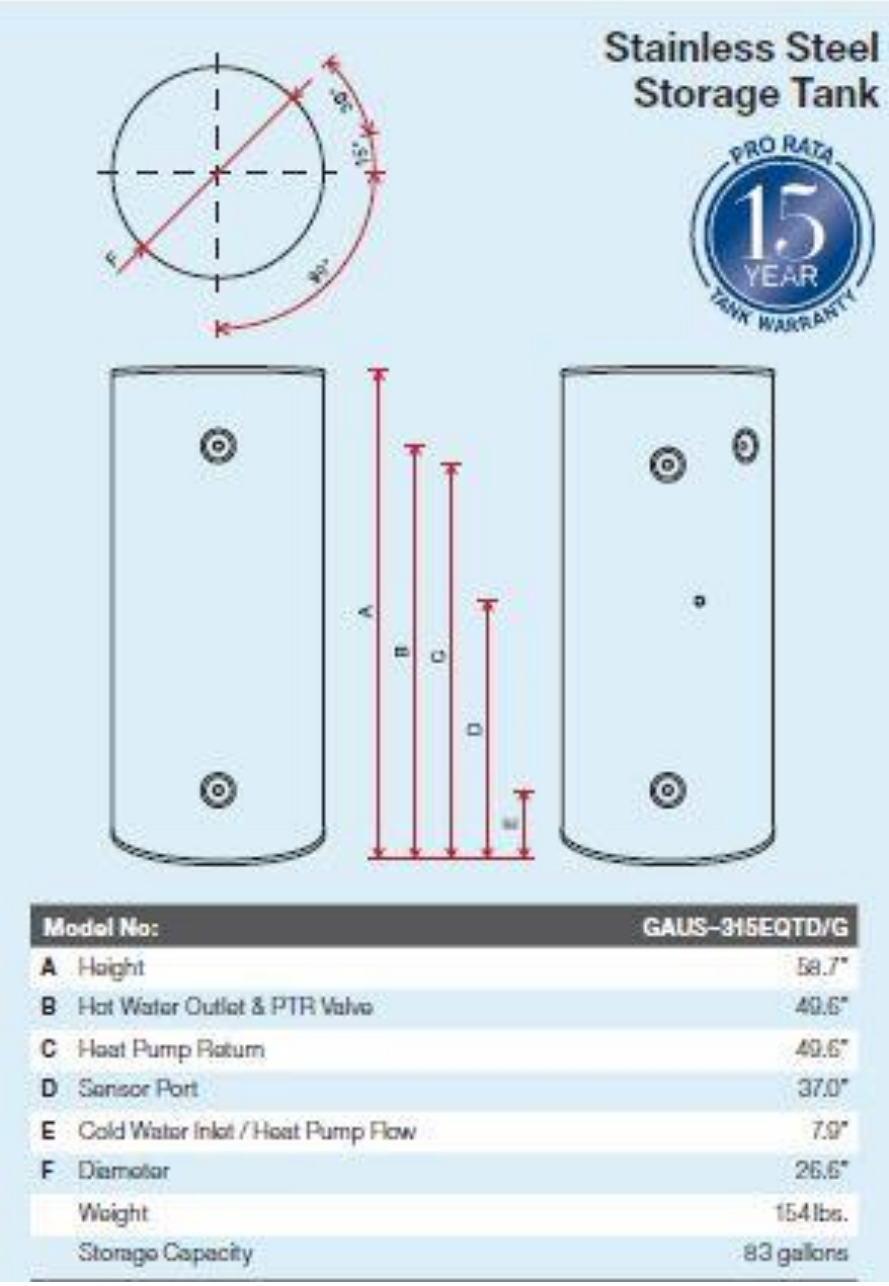
Changing, or alternating, from one water supply to another can have a detrimental effect on the operation and/or life expectation of the water tank unit cylinder, PR valve, water heating circulation and the heat exchanger in the system.

Where there is a changeover from one water supply to another, for example, a rainwater tank supply, desalinated water supply, public recirculated water supply or water brought in from another supply, then water chemistry information should be sought from the supplier or the water should be tested to ensure it meets the warranty requirements in this installation manual.

Dimensions and Technical Data

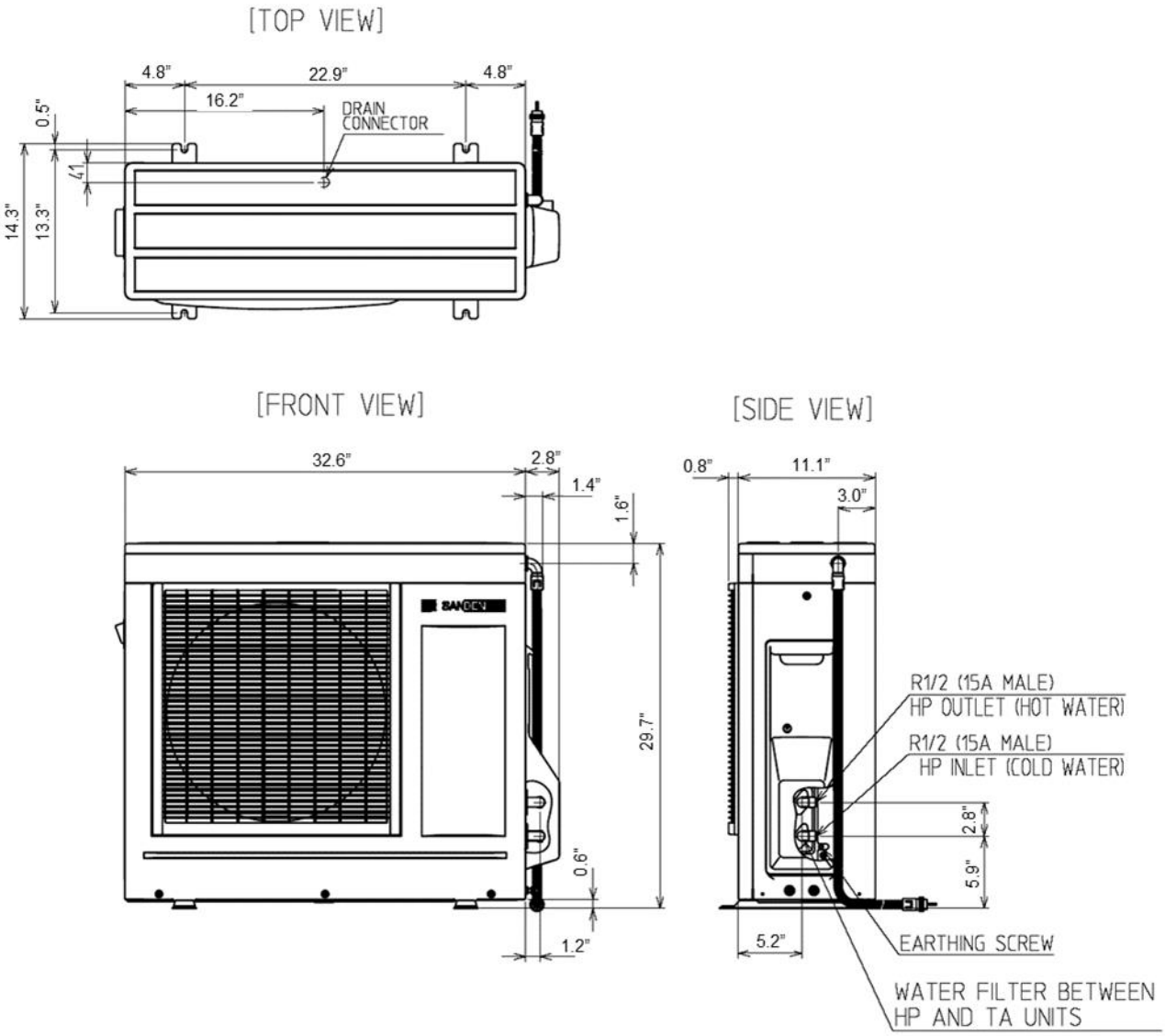
Hot water storage tank unit GAU-315EQTE

Storage capacity	83 gallons (315 litres)
Product weight	180 lbs (82 kg)
Design pressure	101 PSI (700 kPa)
Storage tank material	Stainless steel
Outside casing	Colour coated zinc steel



Model No:	GAUS-315EQTD/G
A Height	58.7"
B Hot Water Outlet & PTR Valve	49.6"
C Heat Pump Return	49.6"
D Sensor Port	37.0"
E Cold Water Inlet / Heat Pump Flow	7.9"
F Diameter	26.6"
Weight	154 lbs.
Storage Capacity	83 gallons

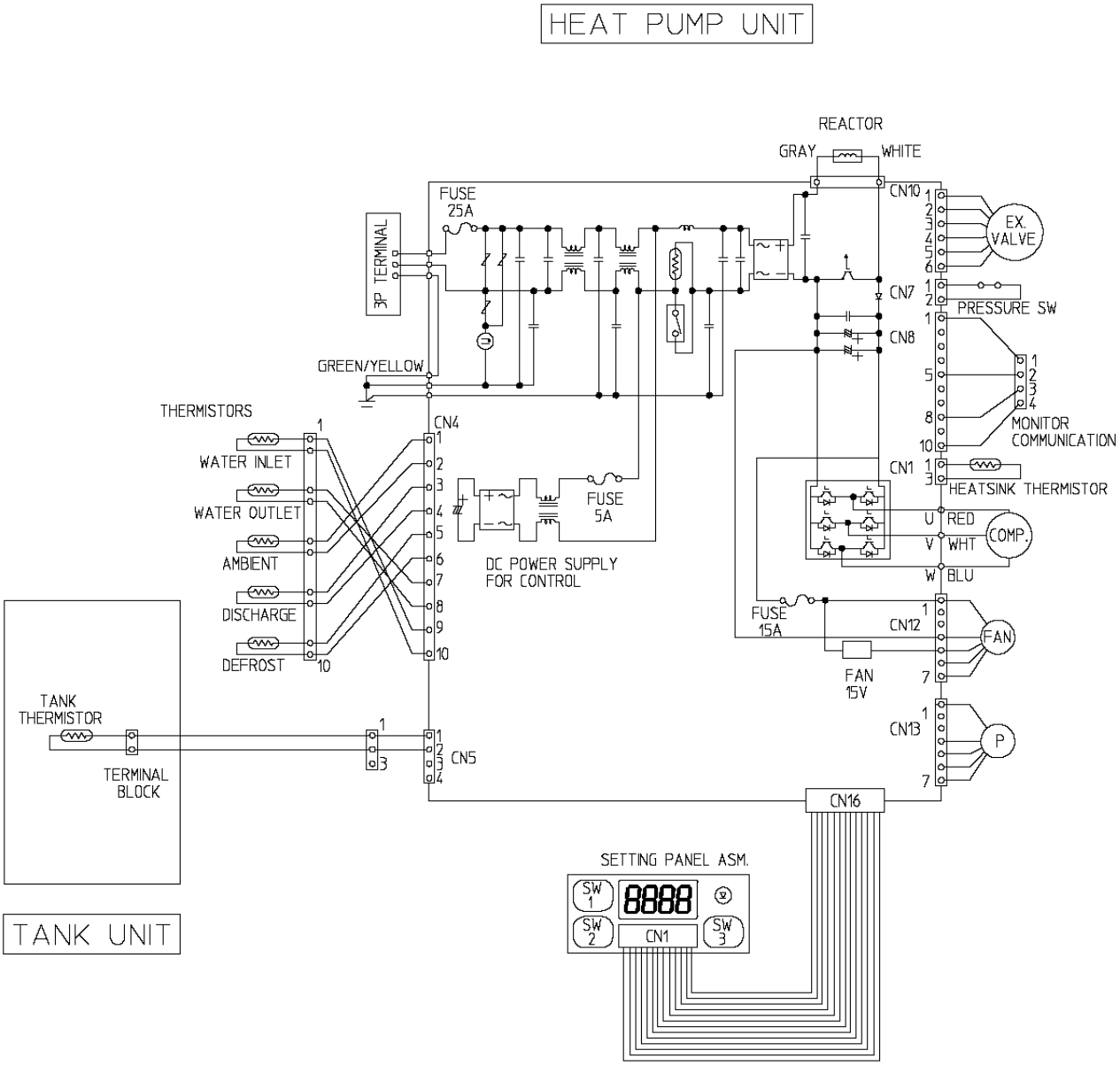
Heat pump unit GAU-A45HPA



Refrigerant type	R744(CO_2)
Product weight	123lbs/56 kg
Thermal capacity	15,350 Btu/h 4.5 kw *1
Power consumption	1.0 kw *1
COP	4.5 *1
Heated water temp.	149 °F (65 °C)

*1 Ambient temp. (Dry / Wet) 61 °F (16°C) / 63 °F (17°C), Inlet water temps. 63°F (17°C), Outlet -water temp. 149°F (65°C)

Wiring Diagram



Warranty Policy

Warranty Conditions

1. The Sanden Heat Pump Water Heater System must be installed in accordance with the installation instructions supplied with the Heat Pump Water Heater System, and in accordance with all relevant statutory/local requirements of the state/province/municipality in which the water heater is installed.
2. Where a failed component or Heat Pump Water Heater System is replaced under warranty, the balance of the original warranty period will remain effective. The replaced part or Heat Pump Water Heater System does not carry a new warranty.
3. Where the Heat Pump Water Heater System is installed outside the boundaries of a metropolitan area as defined by Sanden or further than 15 miles from an accredited service agent, the cost of transport, insurance and travelling costs between the nearest accredited service agent's premises and the installed site shall be the owner's responsibility.
4. Where the Heat Pump Water Heater System is installed in a position that does not allow safe, ready access, the cost of accessing the site safely, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility.
5. The warranty only applies to the Heat Pump Water Heater System and original or genuine (company) component replacement parts and therefore does not cover any plumbing or electrical parts supplied by the installer and not an integral part of the Heat Pump Water Heater System. Such parts would include pressure regulating valve, isolation valves, check valves, electrical switches, pumps or fuses.
6. The Heat Pump Water Heater System must be sized to supply the hot water demand in accordance with the guidelines in the Sanden Heat Pump Water Heater System literature.
7. This warranty is for parts only, any and all labor costs associated with diagnosis, removal of the faulty part and installation of replacement parts will solely be the owner’s responsibility.

Warranty Exclusions

1. Repair and replacement work will be carried out as set out in the Sanden Heat Pump Water Heater System warranty. However the following exclusions may void the warranty and may incur additional service charges and/or cost of parts:
2. Accidental damage to the Heat Pump Water Heater System or any component, including: Acts of God, failure due to misuse, incorrect installation, attempts to repair the water heater other than by a Sanden accredited service agent or the Sanden service department.
3. Where it is found there is nothing wrong with the Heat Pump Water Heater System; where the complaint is related to excessive discharge from the temperature and/or the pressure relief valve due to high water pressure; where there is no flow of hot water due to faulty plumbing; where water leaks are related to plumbing and not the Heat Pump Water Heater System or its components; where there is a failure of electricity or water supplies; where the supply of electricity or water does not comply with relevant codes or acts.
4. Where the Heat Pump Water Heater System or its component has failed directly or indirectly as a result of excessive water pressure.
5. Overflow vent drain has not been installed or blocked or corroded
6. Where the Heat Pump has rusted as a result of a corrosive atmosphere;

Cont

7. Where the unit fails to operate or fails as a result of ice formation in the piping to or from the Heat Pump Water Heater System.
8. Where the Heat Pump Water Heater System is located in a position that does not comply with the Heat Pump Water Heater System installation instructions or relevant statutory requirements, causing the need for major dismantling or removal of cupboards, doors or walls, or use of special equipment to bring the Heat Pump Water Heater System to floor or ground level or to a serviceable position.
9. Repair and/or replacement of the Heat Pump Water Heater System due to scale formation in the waterways or the effects of either corrosive water or water with a high chloride or low PH level when the water heater has been connected to a scaling or corrosive water supply or a water supply with a high chloride or low PH level as outlined in the Owner's Guide and Installation Manual.

   Subject to any statutory provisions to the contrary, this warranty excludes any and all claims for damage to furniture, carpets, walls, foundations or any other consequential loss either directly or indirectly due to leakage from the Heat Pump Water Heater System, or due to leakage from fittings and/or pipe work of metal, plastic or other materials caused by water temperature, poor workmanship or other modes of failure.

Warranty Period

Subject to the Warranty Conditions and Exclusions stated above, your Sanden Heat Pump Water Heater System is warranted as follows:

Heat pump unit – Three years from date of installation

Tank unit – Fifteen years (Pro-rated) from date of installation

Post installation inspection checklist

On completion of the installation, inspect and check off each item in the charts on the following page.

Once the inspection has been completed remove the inspection table and hand to the customer.

Check sheet

Safety items

Action	Completed
Fix the tank unit in place with anchor bolts if necessary.	
The floor below the tank has been properly water proofed and is capable of supporting the tank.	
The mains breaker is of the correct size and voltage Breaker can be turned off, local disconnect in place.	
Ground wiring is installed and tight.	
The Heat Pump unit is installed on a level sturdy surface.	
There are no gas containers or flammable materials anywhere near the unit.	
The wiring between the tank unit and the heat pump unit is properly connected.	

Around units

Action	Completed
A concrete base block is installed (if necessary).	
An inspection space is retained in accordance with the installation manual	

Around the piping

Action	Completed
Dedicated water shut off valves are installed.	
The piping for the water supply/hot water supply pipe has been properly insulated.	
There is no water leaking from the water supply/hot water supply and heat pump pipes.	
In areas subject to snap freezes, protection is provided – Heat Tape, insulation etc	
Union joints are used so that the parts can be easily removed.	
Piping is installed from the drain outlet and drain pan to a building or area where condensate cannot freeze and pose a slip hazard.	
The filter in the pressure-reducing valve is clean.	
Independent pipes, not a twin tube, are used for the heat pump unit pipes.	
The drainage hose from the heat pump unit leads into a building drain or area for disposal.	
Insulation is provided for the water supply/hot water supply and heater pump pipes.	
During draining of the tank unit water does not overflow from the building drain.	

Installed By…… Date……

Inspected By …… Date……

Memo